LABEL HOLDER FOR TEST TUBES USED IN MEDICAL ANALYSES, PARTICULARLY IN THE ANALYSIS OF THE ERYTHROCYTE SEDIMENTATION RATE (ESR)

Technical Field

The present invention relates to a label holder for test tubes used in medical analyses, particularly in the analysis of the erythrocyte sedimentation rate (ESR).

Background Art

It is well-known that ESR analysis is based on the fact that in blood treated with anticoagulant and closed in a test tube that is kept constantly vertical, the erythrocyte sedimentation rate has appreciable variations or changes during pregnancy and in various disorders. Automatic measurement of ESR consists in analyzing by means of infrared rays blood samples sealed hermetically in disposable in vitro test tubes complete with anticoagulant (3.8% sodium citrate), which act as a collection instrument since they are closed in vacuum during manufacture and are therefore capable of performing, by means of an appropriately provided needle, the calibrated aspiration of an equal amount of blood for all the test tubes.

The present invention has been devised in order to solve the problem of difficulties met during the ESR analysis due to the fact that the test tube is partly screened by the label that bears the patient identification data and all the information required for analysis.

Currently, in an attempt to obviate this drawback, the test tube is inserted in a container or auxiliary test tube that bears the label, but when said container is temporarily removed to perform analysis, the test tube is anonymous and easy to confuse with others.

There are also solutions that provide test tubes having a non-cylindrical cross-section, in order to limit the application of the label to a single flat portion or face of a prism-shaped container, but this entails dimensional problems due to the limited extension of each one of the obtainable flat

portions.

It is inconceivable to resort to an increase in the length of the test tube for various reasons: first of all because the dimensional standards of this type of product would be abandoned, with consequent difficulty for their use where automatic labeling systems are present, and also because since the test tubes are made of PET in order to achieve high vacuum tightness, exceeding certain ratios between length and diameter would cause feasibility problems, since it would not be possible to ensure perfect linearity.

Disclosure of the Invention

The aim of the present invention is therefore to provide a label holder that allows to obviate the drawbacks of known label holders.

This aim is achieved with a label holder whose characteristics are defined in the appended claims.

With the proposed solution, the test tube does not remain anonymous during ESR analysis, whose execution is nonetheless free from any optical hindrance. Moreover, the label holder provides the label with a relatively large supporting surface even when using a test tube that has a small diameter.

Brief description of the Drawings

The invention is described hereinafter with reference to the accompanying drawings, in which by way of non-limitative example:

Figure 1 is a side view of a test tube complete with label holder;

Figure 2 is an enlarged-scale partial longitudinal sectional view of the test tube with label holder, taken along the line II-II of Figure 1;

Figure 3 is a longitudinal sectional view of the test tube, complete with label holder and inserted, together with said label holder, in an implement provided with a needle for drawing blood with the vacuum method;

Figure 4 is a longitudinal sectional view of the test tube after drawing

blood and during the extraction of the label holder;

Figure 5 is a side view of the test tube with the label holder in the fully extracted position to allow ESR analysis.

Ways of carrying out the Invention

With reference to Figures 1 to 3, the reference numeral 1 designates a known type of test tube, constituted by two cylindrical portions 2 and 3 that are mutually connected by means of an intermediate frustum-shaped third portion 4. The portion 3 is closed at one end, while the portion 2, which is significantly shorter than the portion 3, is provided with the mouth of the test tube, which is closed hermetically by a stopper 5.

The stopper 5 is made of a material such as rubber and is provided with a collar 6 that has a recess 7 at its center.

A cap 8 is applied to the stopper 5 and is composed of a cylindrical sleeve 9 and an internal flange 10, at the center of which there is an opening 11 that faces the recess 7.

An annular lip 12 is formed inside the cap 7 and forms, with the flange 10, a seat 13 for accommodating the collar 6 of the stopper.

The annular lip 12 protrudes radially until it is interposed between the collar 6 and the rim of the mouth of the test tube.

A tubular element 14 is slidingly arranged on the test tube 1 and acts as a label holder. The tubular element 14 is made of plastics and comprises a cylindrical part 15, which is guided on the sleeve 9 of the cap 8 and ends with a part 16 that tapers conically and is guided on the portion 3 of the test tube 1. The diameter of the narrowest end of the part 16 is slightly smaller than the diameter of the portion 3, so that the part 16 can elastically clamp the portion 3 and slide thereon with friction, providing thus a position retaining means for the tubular element 14.

An annular slot 17 is formed inside the end of the cylindrical part 15 that lies opposite the conical part 16, and an annular disk 18 is recessed therein with its outer edge, said disk having a central opening 19 that faces

the opening 11 of the flange 10 and completes the label holder.

The length of the tubular element 14 is such that once it is applied to the test tube until the disk 18 abuts against the flange 10, it covers most of the test tube, leaving exposed only the closed end of the portion 3.

Two diametrically mutually opposite tabs 20 and 21 that constitute retention means for retaining the element 14 are formed in the section of the cylindrical part 15 that lies proximate to the disk 18 and protrude toward the conical part 16. The tabs 20 and 21 are provided with respective internal protrusions 22 and 23 that are directed toward the test tube. The protrusions 22 and 23, when the label holder 14 is fitted onto the test tube until the disk 18 is in contact with the flange 10 of the cap 8, engage below the edge of the sleeve 9 of the cap 8, so as to retain, albeit in a detachable manner, the label holder 14 on the test tube 1 and prevent said test tube from sliding out during the maneuvers performed by the operator assigned to blood sample taking.

As shown by Figure 3, the label holder can be used with a conventional implement 24 for blood sample taking, which is composed of a cylinder 25 provided with an end face 26 crossed by a needle 27. In order to collect the blood, the test tube 1, inserted beforehand in the label holder, is inserted so that the needle 27, by passing through the openings 11 and 19, pierces the stopper 5, so as to allow to transfer the blood into the test tube 1.

Once the sample has been taken and the needle 27 has been removed, the label holder 14 can be extracted from the test tube, overcoming the resistance of the tabs 20 and 21 and of the friction of the part 16 on the portion 3 of the test tube (see Figure 4) until the part 16 abuts against the portion 4 that connects the portion 2 to the portion 3. In this position, the label holder 14 remains retained in the position for extraction from the test tube by the friction effect applied by the part 16 to the portion 3 of the test tube. In this position, as shown by Figure 5, the entire region of the test tube affected by filling and by ESR analysis remains exposed without separating

the label holder from the test tube.

The described label holder is susceptible of numerous variations, all of which are within the scope of the appended claims. For example, the cap can be omitted and the raised portions 22 and 23 of the tabs 20 and 21 can engage directly under the collar 6 or under a lip of the mouth of the test tube, which is folded outward.